

**DIRECT TESTIMONY OF**

**JOSEPH WADE RICHARDS**

**ON BEHALF OF**

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

**DOCKET NO. 2018-197-E**

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION.**

A. My name is Joseph Wade Richards. My business address is 601 Old Taylor Road, Mail Code J37, Cayce, South Carolina 29033. I am employed by South Carolina Electric & Gas Company ("SCE&G" or "Company") where I am a Senior Engineer in Transmission Planning.

**Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND BUSINESS BACKGROUND.**

A. I am a graduate of Clemson University with a Bachelor of Science degree in Electrical Engineering. I am a registered Professional Engineer in the State of South Carolina.

I began working for SCE&G in 2008 as a System Controller. I was transferred to Operations Planning as an Associate Engineer in 2010 and then to Transmission Planning as an Associate Engineer in 2012. I was promoted to Engineer IV in 2014 and to my current position of Senior Engineer in 2017.

1 **Q. ARE YOU A MEMBER OF ANY INDUSTRY COMMITTEES FOR SYSTEM**  
2 **RELIABILITY ASSESSMENT OR PLANNING?**

3 **A.** Yes, I am currently the representative for SCE&G on the Southeastern  
4 Reliability Corporation ("SERC") Long Term Study Group and the SERC Dynamics  
5 Study Group. Additionally, I am a member of the Carolinas Transmission  
6 Coordination Agreement Power Flow Study Group, the Dynamics Study Group and  
7 the Eastern Interconnection Planning Collaborative Steady State Model Load Flow  
8 Working Group.

9 All of these committees are directly involved with assessing the current and  
10 future capabilities of the integrated transmission grid in North America, the Southeast,  
11 and the Carolinas.

12  
13 **Q. PLEASE SUMMARIZE YOUR DUTIES AS A SENIOR ENGINEER IN**  
14 **TRANSMISSION PLANNING.**

15 **A.** I am responsible for the planning and associated analyses of the SCE&G  
16 electric transmission system to ensure compliance with required transmission  
17 planning and operating standards and criteria, as discussed below, and to ensure the  
18 safety, reliability and adequacy of the internal SCE&G transmission system as well  
19 as our interconnection transmission facilities with neighboring utilities.

1 **Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.**

2 **A.** The purpose of my testimony is to discuss the need and necessity for the  
 3 construction of the ~~Pepperhill~~- Summerville 230 kV Line, the ~~Williams~~- ~~Pepperhill~~  
 4 230 kV Line Segment, and the Canadys – Faber Place 230 kV Line Segment  
 5 (collectively, the “Lines”) and associated facilities in Berkeley and Charleston  
 6 Counties, South Carolina. I also discuss SCE&G’s request that the Commission  
 7 make a determination that the rebuild of the existing ~~Williams~~- Summerville 230  
 8 kV Line between Summerville and Ladson Junction constitutes “the replacement of  
 9 an existing facility with a like facility” and therefore does not constitute  
 10 “construction of a major utility facility” for which certification would be required  
 11 under the Utility Facility Siting and Environmental Protection Act.

12 The ~~Pepperhill~~- Summerville 230 kV Line is planned to run from SCE&G’s  
 13 existing ~~Pepperhill~~ 230/115 kV Substation in North Charleston, South Carolina, to  
 14 SCE&G’s existing Summerville 230/115 kV Substation near Summerville, South  
 15 Carolina along existing rights-of-way for approximately 7.8 miles. The ~~Pepperhill~~  
 16 – Summerville 230 kV Line will share single pole, double circuit (“SPDC”)  
 17 structures with the ~~Williams~~- Summerville 230 kV Line between Summerville and  
 18 Ladson Junction for approximately 3.9 miles to a point approximately 400 feet south  
 19 of Ancrum Road in Charleston County. From that point to the ~~Pepperhill~~  
 20 Substation, the ~~Pepperhill~~ – Summerville 230 kV Line will share SPDC structures  
 21 with the ~~Williams~~- Canadys 230 kV Line (to be renamed the ~~Williams~~- ~~Pepperhill~~

1 230 kV Line following retermination at the Pepperhill Substation) for  
2 approximately 3.5 miles.

3 The Williams – Pepperhill 230 kV Line Segment is planned to run  
4 approximately 3.7 miles from the point approximately 400 feet south of Ancrum  
5 Road in Charleston County to the Pepperhill 230/115 kV Substation terminal. The  
6 Williams – Pepperhill 230 kV Line Segment includes the rebuild of the existing  
7 approximately 3.5-mile segment of the Williams – Canadys 230 kV Line and  
8 approximately 1,000 feet of new line on single pole, single circuit structures.

9 The Canadys – Faber Place 230 kV Line Segment is planned to run  
10 approximately 350 feet in existing right-of-way contiguous to the Pepperhill  
11 230/115 kV Substation. This segment will be connected to the existing Pepperhill  
12 – Faber Place 230 kV Line after that line is disconnected from its 230 kV terminal  
13 at the Pepperhill Substation and to the remaining portion of the existing Williams –  
14 Canadys 230 kV Line after the other portion of the Williams – Canadys 230 kV  
15 Line is terminated at the Pepperhill 230/115 kV Substation. This will form the  
16 Williams – Pepperhill 230 kV Line Segment.

17 Associated facilities to be added to SCE&G's transmission system include  
18 one new 230 kV line terminal at the Pepperhill 230/115 kV Substation and one new  
19 230 kV line terminal at the Summerville 230/115 kV Substation.

20 Each of these facilities is shown on the map attached hereto as Exhibit No. \_\_\_\_  
21 (JWR-1).

**Q. WHAT CRITERIA DOES SCE&G USE TO DETERMINE WHEN NEW TRANSMISSION FACILITIES ARE NEEDED?**

A. The Company uses national and internal criteria to guide its decision-making related to the development of new or upgraded transmission facilities. Nationally, our Company subscribes to the Transmission Planning Reliability Standards established by the North American Electric Reliability Corporation ("NERC"), and internally SCE&G adheres to its Long Range Planning Criteria. In accordance with these standards and criteria, the SCE&G Transmission System is designed so that nothing more serious than local load impacts will occur during certain contingencies and so that after appropriate switching and re-dispatching, all non-radial loads can again be served with reasonable voltages, and all facilities can again operate within acceptable operating limits. A sample of contingencies considered includes:

1. Loss of any generator;
2. Loss of any transmission circuit operating at a voltage level of 115 kV or above;
3. Loss of any transmission transformer;
4. Loss of any electrical bus and associated facilities operating at a voltage level of 115 kV or above;
5. Loss of all 115 kV or above circuits on a common structure;
6. Loss of entire generating capacity in any one generating plant;

- 1        7.    Loss of any generating unit simultaneously with the loss of a single
- 2                transmission line;
- 3        8.    Loss of all components associated with a transmission circuit breaker failure;
- 4                and
- 5        9.    Loss of any generator, transmission circuit, or transmission transformer,
- 6                followed by manual system adjustments, followed by the loss of another
- 7                generator, transmission circuit, or transmission transformer (i.e. N-1-1
- 8                analysis).
- 9

10    **Q.    WHY ARE THE LINES AND ASSOCIATED FACILITIES NEEDED?**

11    A.        SCE&G Transmission Planning power flow studies have identified two

12                possible future single contingency occurrences in the southern region of its service

13                area that would constitute violations of both NERC Transmission Planning

14                Standards and SCE&G's Long Range Planning Criteria as early as May 2020. More

15                specifically, the single contingency occurrences identified are 1) an outage on the

16                Summerville 230/115 kV Substation's 230 kV #2 Bus and 2) an outage of two

17                circuits that share common structures (the St. George– Summerville 230 kV #1 and

18                #2 Lines). Contingency 1 results in the loss of the St. George– Summerville 230

19                kV #2 Line, the Williams – Summerville 230 kV Line, and the 230/115 kV #2

20                transformer at the Summerville 230/115 kV Substation. This would then result in

21                thermal violations on the only remaining Summerville 230/115 kV transformer (#1)

22                and heavy loading on other electrical equipment. Contingency 2 would result in

1 thermal violations on the Canadys – Church Creek 230 kV Line and heavy loading  
2 on other electrical equipment.

3 To address the reliability issues just described, SCE&G proposes to add the  
4 Pepperhill – Summerville 230 kV Line, the Williams – Pepperhill 230 kV Line  
5 Segment and associated facilities to its transmission system in the southern region  
6 of its electric service area. The addition of these two 230 kV lines will mitigate  
7 these reliability concerns and improve power flow in the southern region of  
8 SCE&G's service area.

9 To accommodate this work, the existing Pepperhill – Faber Place 230 kV  
10 Line will be disconnected from its 230 kV terminal at the Pepperhill Substation and  
11 reconnected to the Canadys 230/115 kV Substation. To accomplish this new  
12 connection at the Canadys Substation, the span now connected to the 230 kV line  
13 terminal at the Pepperhill Substation, approximately 350 feet in length, will be  
14 relocated (as the new Canadys – Faber Place 230 kV Line Segment) and connected  
15 to the remaining portion of the existing Williams – Canadys 230 kV Line, which  
16 will be available after a portion of the Williams – Canadys 230 kV Line is  
17 terminated at the Pepperhill Substation to form the Williams – Pepperhill 230 kV  
18 Line Segment. When this connection is completed, the name of the existing  
19 Pepperhill – Faber Place 230 kV Line will be changed to the Canadys – Faber Place  
20 230 kV Line.

1 **Q. IN DETERMINING TO BUILD THE LINES, WHAT ALTERNATIVES DID**  
 2 **SCE&G CONSIDER?**

3 **A. To address overloading of Summerville 230/115 kV Transformer #1 and the**  
 4 **Canadys -- Church Creek 230 kV Line by May 2020, SCE&G Transmission**  
 5 **Planning considered five alternatives:**

- 6 **1. Rebuild the Williams -- Summerville 230 kV Line as SPDC with**  
 7 **bundled 1272 ACSR conductor to create the Williams-- Summerville**  
 8 **230 kV #2 line.**
- 9 **2. Add a third 230/115 kV transformer at Summerville.**
- 10 **3. Rebuild the Williams-- Summerville 230 kV Line and the Williams--**  
 11 **Summerville 115 kV Line as SPDC with bundled 1272 ACSR**  
 12 **conductor, adding two additional 230 kV circuits, from Summerville**  
 13 **Substation to Ladson Junction and then connect these two 230 kV**  
 14 **circuits to the existing South Carolina Public Service Authority**  
 15 **("SCPSA") Carnes -- Mateeba 230 kV Line to create the Summerville**  
 16 **--Carnes 230 kV SCPSA Tieline and the Summerville-- Mateeba 230**  
 17 **kV SCPSA Tieline.**
- 18 **4. Construct a new seven-terminal 230 kV Transmission switching**  
 19 **station east of Summerville near Ancrum Road ("Ancrum Switching**  
 20 **Station"), rebuild the Williams-- Summerville 230 kV Line as SPDC**  
 21 **with bundled 1272 ACSR conductor from Summerville Substation to**

Ancrum Switching Station, split the Williams – Canadys 230 kV Line and the SCPSC Carnes – Mateeba 230 kV at the Ancrum Switching Station, and terminate all of these 230 kV lines into the Ancrum Switching Station.

5. Rebuild the Williams – Summerville 230 kV Line from Summerville Substation to Ladson Junction and the Williams – Canadys 230 kV Line from Ladson Junction to Pepperhill Substation as SPDC with bundled 1272 ACSR conductor to create the Pepperhill – Summerville 230 kV Line.

Alternatives 1 and 2 are effective alternatives to address the Summerville Substation 230/115 kV Transformer #1 loading, but do not resolve remaining loading issues on the Canadys – Church Creek 230 kV Line. Alternative 3 is a marginally effective alternative for the Summerville Substation 230/115 kV Transformer #1 loading issue, but it does not resolve remaining loading concerns on the Canadys – Church Creek 230 kV Line and cannot be completed by May 2020. Alternative 4 is an ineffective alternative for Summerville Substation 230/115 kV Transformer #1 loading since it introduces several new contingencies that cause overloads on other elements of the system. In addition, Alternative 4 would require siting and land acquisition and cannot be completed by May 2020. Alternative 5 offers excellent electrical performance for Summerville Substation 230/115 kV Transformer #1 loading and also provides significant loading margins to allow for future load growth. It also relieves loading on the Canadys – Church Creek 230 kV

1 Line with the exception of one contingency. This N-1-1 contingency, loss of the  
2 Canadys – Faber Place 230 kV Line and the Church Creek – Ritter 230 kV Line,  
3 can be mitigated with a simple operating guide, which relieves loading on the  
4 Canadys – Church Creek 230 kV Line to well within its thermal rating. Alternative  
5 5 is the best performing alternative and can be constructed by the in service deadline  
6 of May 2020. For these reasons, Alternative 5 is the selected alternative.  
7

8 **Q. PLEASE DESCRIBE THE PROCESS BY WHICH SCE&G SELECTED**  
9 **THE ROUTE FOR THE LINES.**

10 A. SCE&G determined that the Lines could be built entirely within the existing  
11 rights of way between the Summerville 230/115 kV Substation and the Pepperhill  
12 230/115 kV Substation and existing rights-of-way contiguous to the Pepperhill  
13 230/115 kV Substation. The use of existing rights-of-way significantly minimizes  
14 potential for environmental, land use, cultural resource and scenic impacts and  
15 eliminates costs associated with the acquisition of new rights-of-way. Therefore,  
16 SCE&G did not consider alternate greenfield routes for the construction of the  
17 proposed Lines.  
18  
19  
20

1 **Q. WHAT IS THE ESTIMATED COST AND IN-SERVICE DATE OF THE**  
2 **PROPOSED LINES AND ASSOCIATED FACILITIES?**

3 **A.** The total cost of construction for the proposed Lines and associated facilities  
4 is approximately \$13.7 million.

5 The Lines and associated facilities are scheduled to be completed by May 1,  
6 2020.

7  
8 **Q. DO THE PROPOSED LINES AND ASSOCIATED FACILITIES SERVE**  
9 **THE INTERESTS OF SYSTEM ECONOMY AND RELIABILITY?**

10 **A.** Yes. The proposed facilities serve the interests of system economy and  
11 reliability. They represent the most cost-effective proposal considering system  
12 needs and constraints and the best long-term solution for the continued transmission  
13 of safe, reliable electric power to SCE&G's customers. The addition of the Lines  
14 and associated facilities will improve power flow and prevent unacceptable thermal  
15 loading and System Operating Limit violations (as defined by NERC) on the  
16 transmission system in the southern region of SCE&G's electric service area and  
17 ensure that SCE&G remains in compliance with both NERC Transmission Planning  
18 Reliability Standards and the Company's Long Range Planning Criteria.

1 **Q. IS THERE A REASONABLE ASSURANCE THAT THE LINES AND**  
2 **ASSOCIATED FACILITIES WILL CONFORM TO APPLICABLE STATE**  
3 **AND LOCAL LAWS AND REGULATIONS?**

4 **A.** Yes. SCE&G currently operates all of its existing transmission facilities  
5 within the applicable state and local laws and regulations, and we are committed to  
6 operating the Lines and associated facilities within applicable state and local laws  
7 and regulations as well.  
8

9 **Q. DOES THE PUBLIC CONVENIENCE AND NECESSITY REQUIRE THE**  
10 **CONSTRUCTION OF THE LINES AND ASSOCIATED FACILITIES?**

11 **A.** Yes. The public convenience and necessity requires construction of the  
12 Lines and associated facilities. These new Lines and associated facilities are critical  
13 to the operational integrity of SCE&G's electric transmission system and are  
14 necessary to ensure that SCE&G remains in compliance with the NERC  
15 Transmission Planning Reliability Standards and the Company's own Long-Range  
16 Planning Criteria. Failure to construct the Lines and associated facilities could  
17 result in unacceptable thermal loading and System Operating Limit violations on  
18 the electric transmission system in the southern region of SCE&G's electric service  
19 area as early as May 2020. Accordingly, the new Lines and associated facilities  
20 serve the interests of system economy and reliability.  
21

1 **Q. EXPLAIN WHY THE REBUILD OF THE APPROXIMATELY 3.9-MILE**  
2 **SEGMENT OF THE EXISTING WILLIAMS – SUMMERVILLE 230 kV**  
3 **LINE BETWEEN SUMMERVILLE AND LADSON JUNCTION**  
4 **CONSTITUTES “THE REPLACEMENT OF AN EXISTING FACILITY**  
5 **WITH A LIKE FACILITY.”**

6 **A.** In an approximately 3.9-mile long section of existing right-of-way between  
7 Summerville and Ladson Junction, the existing H-frame structures on which the  
8 Williams– Summerville 230 kV Line currently resides will be removed, and SPDC  
9 structures will be installed in their place. The new Pepperhill– Summerville 230  
10 kV Line for which a Certificate is being requested will reside on one side of these  
11 SPDC structures and the existing Williams– Summerville 230 kV Line will reside  
12 on the other side. The conductor on the Williams– Summerville 230 kV Line will  
13 be upgraded to bundled 1272 ACSR conductor. The replacement segment of the  
14 Williams – Summerville 230 kV Line will not result in any significant increase in  
15 environmental impact of the facility or substantially change the location of the  
16 facility. Therefore, the rebuild of the existing Williams– Summerville 230 kV Line  
17 between Summerville and Ladson Junction constitutes “the replacement of an  
18 existing facility with a like facility” and therefore does not constitute “construction  
19 of a major utility facility” for which certification would be required under the Utility  
20 Facility Siting and Environmental Protection Act.  
21  
22

1   **Q.   WHAT ARE YOU ASKING THIS COMMISSION TO DO?**

2   **A.           SCE&G respectfully asks that the Commission issue a Certificate of**  
3   **Environmental Compatibility and Public Convenience and Necessity for the**  
4   **construction and operation of the Pepperhill – Summerville 230 kV Line, the**  
5   **Williams – Pepperhill 230 kV Line Segment, the Canadys – Faber Place 230 kV**  
6   **Line Segment and associated facilities. The Company also asks the Commission to**  
7   **make a determination that the rebuild of the approximately 3.9-mile segment of the**  
8   **existing Williams – Summerville 230 kV Line between Summerville and Ladson**  
9   **Junction constitutes “the replacement of an existing facility with a like facility” and**  
10   **therefore does not constitute “construction of a major utility facility” for which**  
11   **certification would be required under the Utility Facility Siting and Environmental**  
12   **Protection Act.**

13  
14   **Q.   DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

15   **A.           Yes.**

